$2 In-Table Router Lift

by Garrett Lambert

When I recently built a new router table and fence, I thought it time to add a router lift. However, most of the commercial units on the market have at least a couple of draw-backs, not least that most are more expensive than the big router they are to host! More fundamentally, only the Jessem MastRLift can handle the many popular brands of plunge routers—Makita, Hitachi, Dewalt, etc.—that do not have the same round-body as a Porter-Cable, and a Makita 3612C has been dedicated to my table for many years. While the MastRLift is among the less expensive versions, I nonetheless wondered if there might be an alternative.

As I pondered the problem, I had another of those small Eureka! realizations that give such great satisfaction. No matter the form of the hardware and decoration, a router lift is nothing more than a screw clamp that squeezes the router base and body together in a controlled manner. With that realization, it was a simple matter to define the three challenges involved:

1. to position the works so they don't interfere with anything,
2. to devise an efficient and convenient method to turn the clamping screw, and
3. to position a fixed-in-place (non-turning) nut on the outer end of the screw.

Just to make the task even more interesting, I wanted a conversion would allow the router to be readily returned to its original condition without alteration, and be do-able with tools any woodworker is likely to have.

No problem at all. What follows is a lot easier to do than explain, and it does no harm to the router. It also applies with minor variations to brands other than the Makita. So, if you have a mind to make one, fear not and press on.

Fortunately, almost every plunge router provides a relatively easy way to position a clamping screw out of the way whether through one of the posts, or by using the external depth limiting-screw mounts. (Note that the latter route does require drilling a hole through the plunge base.) The Makita offers both possibilities, but *through-the-post* is the better approach. With that decided, the first thing to do is withdraw the base from the router and remove one of the posts. At first glance this appears to be a daunting task with a trip to the repair shop in prospect, but it's quite easy and thousands of woodworkers have done it without problem in order to remove the springs.

Unless you also use your router outside the table, this is a good time to also remove all the unnecessary extras such as handles, stop turret, pole stop, dust shield, etc., and store everything in a labeled coffee can. Put the springs and internal guides in there, too, because they're unnecessary in the table.

While the rest of this description is specific to the Makita 3612C, the principles apply to other brands. If you keep in mind that all you're doing is making a very simple clamp, you should find the requirements for your machine self-evident.

After removing the plunge base, I used a punch to drive out the roll-pin so I could remove the post that contains the threaded depth limiter from the base. Pressed into the bottom of that post—it's just a tight fit—is a bushing into which is pressed the depth limiter, also just a tight fit. A mallet and a piece of pipe will drive the bushing out, and a punch will remove the limiter from the bushing. No harm done to any of the parts.

Here's what comes out of the post. (Ignore the piece of brass rod in the depth stop housing. It was a preliminary examination of the feasibility of an external clamp that I forgot to remove for the photo.)

The new screw clamp is based on a piece of ⅜"–16 TPI threaded rod the same length as the original depth limiter. A standard hardware store item, using16 TPI means that every full turn of the screw will raise or lower the bit by exactly 1/16" .

To produce a socket to turn the rod, I decided to screw a small Allen head machine bolt into one end. The odds & ends box produced one that happens to be 4mm, but a 5/32" or 3/16" SAE would do just as well. With that in hand, I chucked the threaded rod in my wood lathe, put a 5/32" bit in a chuck in the tailstock, and at about 450 RPM drilled a hole in the center of the end just a little longer than bolt's thread. I swapped the drill bit for the 4mm tap, and gently turned the chuck with one hand while feeding the tap into the hole with the other, backing out often to clear chips. The same job could be done on a drill press by taking care to center the hole. I now had the driving end almost done.

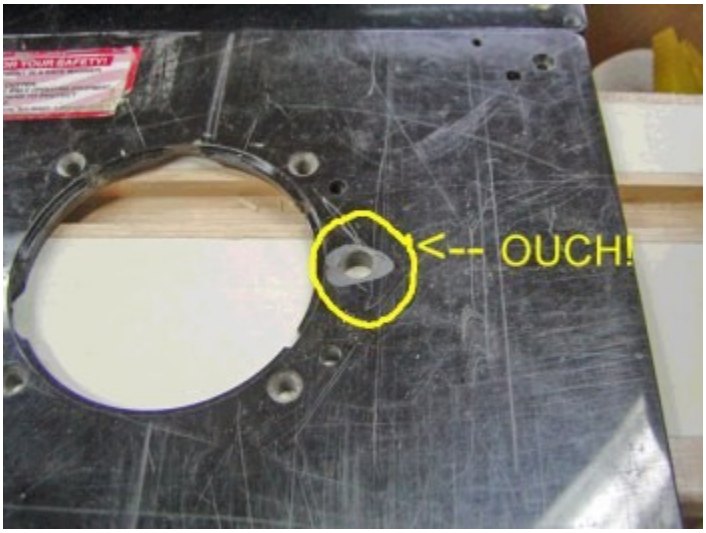
The threads on the ⅜" rod are just a little too big in diameter to slide through the bushing, so with the rod back in the lathe, a coarse file quickly reduced the outside diameter of the first couple of inches to an easy slip fit through the original bushing. This little bit of filing could have been done in a vise, since there is no need for excessive accuracy. Make sure to file down enough of the threads to ensure that the rod can protrude about ¾" past the end of the bushing. A small washer under the machine bolt prevents the bolt and screw from dropping through the bushing. However, the bolt still needs to be fixed in place so that it can't back itself out when being turned counter-clockwise. The simplest way to do this and still enable disassembly is to firmly seat the bolt (don't forget the washer) in the rod and drill a 1/16" hole through both the screw and the bolt. A piece of 1" finishing nail locks the two together, is held in place by the walls of the bushing, but can be slipped out whenever necessary to take everything apart again (which is why the rod needs to be able to protrude).

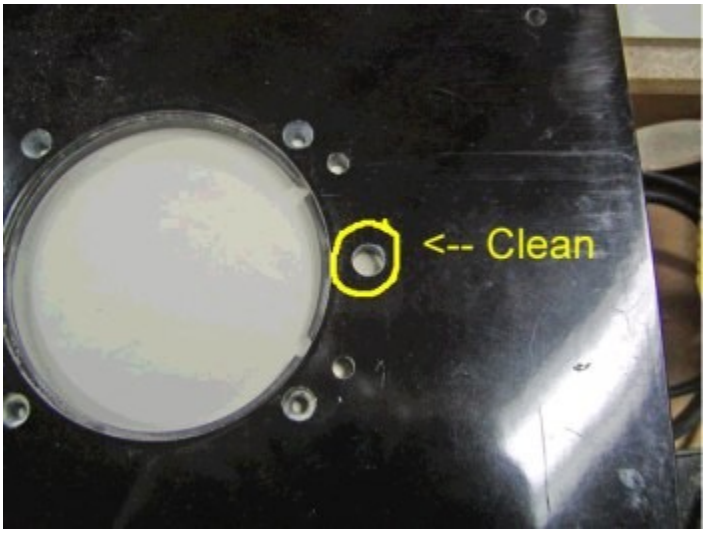
Here are the new parts:

Stand the bushing on a piece of wood on a solid surface, stand the post on it with the holes lined up, and use a wooden mallet to re-insert the bushing. If the holes aren't perfectly lined up, a small punch will lever them into position. Now put the post back in the plunge base. Fortunately, I had a kit of roll pins purchased out of one of the regular flyer sales, and pushed a couple of short ones in from either side to replace the original log one. (The object is to capture the bushing but not press against the threaded rod.) With everything installed, the Allen head machine bolt head protrudes about ¼" above the surface of the plunge base.

Figuring out how to fix a non-rotating nut on the router for the other end of the rod took a little time but proved quite easy once I reminded myself that I was making a clamp that would always be under compression. The Makita has a shoulder where the rod exits, so I found a heavy washer that was too large in diameter to fit the space, marked the excess on one side, and cut it off using a Dremel tool (a hacksaw would do). As the photo shows, the flat that was created sits snugly against the side of the router body and can't turn. It was a simple matter to spot-weld the nut to it so it, too, is fixed in place. If you don't have access to a welder, epoxy will do the job.

That completed the lift, and it was time to mark and drill the hole in the table plate. Since I had purchased a new plate for the new table, I (wisely) decided to drill out the old one first for practice. It's just a matter of sitting the plate on the router with the holes lined up and measuring twice and drilling once. I got both holes dead on, **but** I learned that drilling a ⅜" hole through phenolic requires a bit of technique. Here's the result of the first attempt:





A big chunk of break-out even with a sharp brad point and a backer board in place. So, for the new plate, I drilled a 1/16" hole through the center, and then drilled the ⅜" hole halfway in from each side with this result.

Here's the insert in place with the router mounted.

To keep dust out, a *cover*, or plug, is a small piece of ⅜" rod that can be removed either by sticking a pin in the centrehole, or more elegantly, with a small magnet.

For fine height adjustment, a hex key provides absolute control and precision. However, while I thought that one of the advantages of using the Allen head bolt would be the ability to use a length of 4mm hex key in a drill to move the router a considerable distance, e.g. for bit changes, in fact after trying it to see if it works (it does) I've never bothered again. No effort is needed to raise and lower the router, and only very rarely are enough turns required to make the drill trick worthwhile.

I had already made a small crank from a piece of dowel with an Allen key stuck in one end, but found it wouldn't work with the fence close to the bit.

So, I cranked up the welder to make a simple T handle, and

hammered a short piece of 4mm Allen key into a slightly under-size longitudinal hole in the end. Friction alone keeps it in place, and it works like a charm.